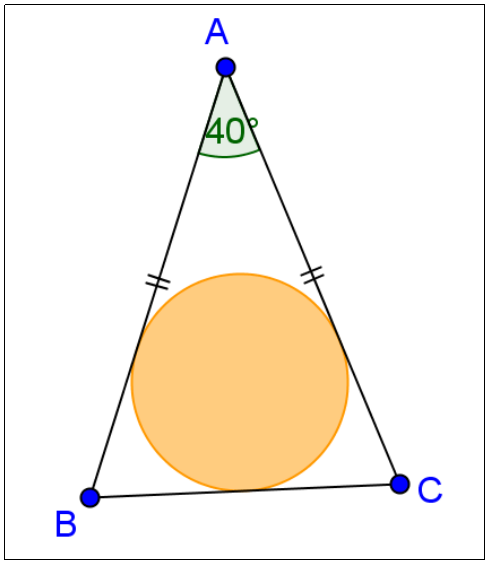
Vertex Angle/Incircle Area Investigation

Good Luck To_____

Good Luck To_____

Warm up



Answer the following questions for the triangle shown at right.

(1) State two triangle area formulas suggested by the figure at right?

If AB=AC=10 units...

(2)What is the area of ΔABC?

(3) What is the length of BC?

(4) What is the perimeter of ΔABC?

(5) What is the radius of the inscribed circle?

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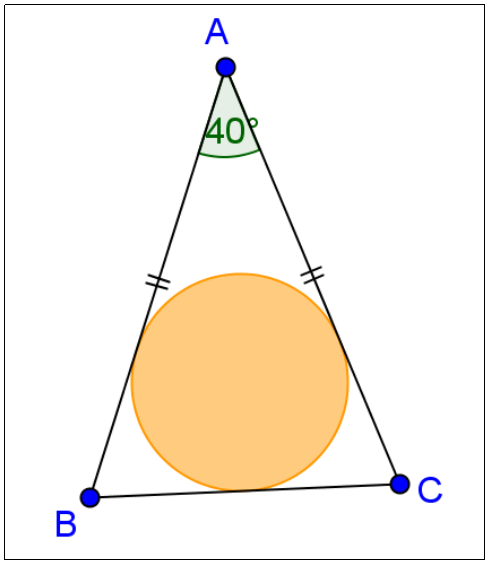
Visualization



Without performing any calculations, answer the following questions using mathematically appropriate language and IF/THEN sentences

Visualize what happens to the area of the inscribed circle as the measure of the vertex angle is changed (the sides legs of the isosceles triangle are NOT changed).

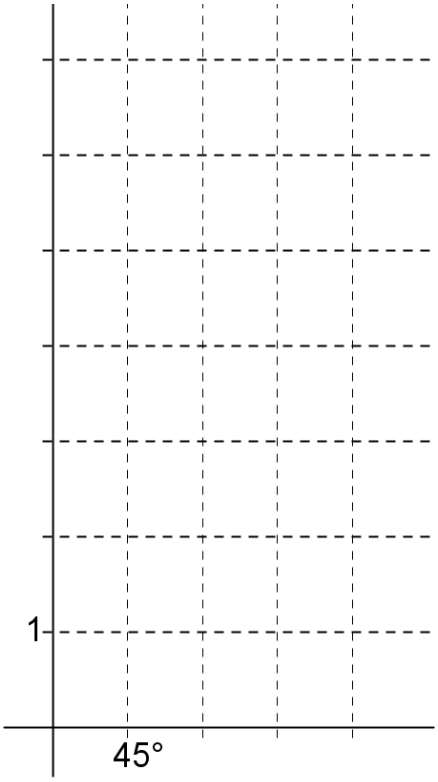
Describe the change in the area as the measure of the vertex angle BAC...

(1) Gets smaller, ultimately becoming 0°.

(2) Gets larger, ultimately becoming 180°.

(3) Gets close to 90° .

(4) Use the graph at right to predict what the graph of the relationship between the vertex angle and the area of the inscribed angle will look like.



(5) Which vertex angle value do you think produces the largest area?

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Instrumentation

Use the applet found at http://tinyurl.com/trianglemeasurements to answer the following questions.

(6) Slowly drag the ANGLE SLIDER to test your conjectures from the previous section. At what angle value does the vertex angle produce the circle with the largest area? What's up with THAT?

(7) Slowly drag the ANGLE SLIDER very close to 180°. Describe what is happening to the plotted point. What's up with THAT?

Do The Math

(8) Confirm the measurement calculations for two different sets of data:

Leg Lengths = _____

Vertex Angle = _____

Incircle Area = _____

Leg Lengths = _____

Vertex Angle = _____

Incircle Area = _____

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Good Luck To_____

Tracing/Algebratize

Use the applet found at http://tinyurl.com/trianglealgebra for the following task.

Click on the ANGLE SLIDER then use the arrow keys on your keyboard to create a trace of the graph of the plotted point.

Based on your work in (8) and in the **Warm Up**, derive an equation that will describe the relationship shown in the graph. Remember! The value of the Vertex Angle is the *x*-value and the area of the incircle is the *y*-value.